

§ 59.10-15

staybolts are fitted with nuts, the nuts may be removed and after reinforcing has been applied, collars may be welded around the staybolts in lieu of the nuts. Such reinforced areas shall not exceed 400 square inches nor more than 30 inches in one direction. Two such areas in any one plate may be reinforced: Provided, that the distance between the reinforced surfaces is not less than 30 inches.

(e) When the corroded portion of a staybolted surface exceeds 400 square inches, it is permissible to make repairs by cutting out the defective portion and replacing it with a new plate, the edges of the new plate to be welded in position. In such cases, new staybolts shall be fitted in accordance with the requirements of § 52.20-15 of this subchapter and where welding is performed through a line of staybolts, welded collars as required by Figure 52.01-3 of this subchapter shall be used to attach the staybolts.

(f) Eroded seams of welded pressure vessels may be repaired by rewelding the wasted portion. The wasted section of the seam shall be excavated sufficiently by grinding, flame or arc gouging or chipping to ensure proper weld penetration. Rewelded seams shall be nondestructively tested in accordance with section VIII, ASME Code.

§ 59.10-15 Rivets and staybolts.

(a) It is not permitted to reinforce or build up by welding the heads of rivets or staybolts that have deteriorated. Such rivets or staybolts shall be replaced. The seal welding of rivet heads to secure tightness is prohibited.

(b) Where leaks develop around staybolts which are otherwise in good condition, the nuts may be replaced with a beveled collar formed around the end of the stay by means of welding. In such cases, the depth of collar measured on the stay and the width measured on the plate, shall be equal to one-half the diameter of the staybolt.

§ 59.10-20 Patches in shells and tube sheets.

(a) Unreinforced openings in the shells or drums of boilers or pressure vessels, the diameter of which does not exceed the maximum diameter of an

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unreinforced opening in accordance with § 52.01-100 of this subchapter may be closed by the use of a patch or plate inside the drum or shell and sealed against leakage by welding. Such plates shall have a diameter of at least 2 inches larger than the diameter of the hole and shall have a thickness equal to the thickness of the plate to which it is attached. It is not permissible to insert such patches in the shell or head flush with the surrounding plate unless the requirements of this subchapter for Class I welded pressure vessels are met.

(b) Portions of tube sheets which have deteriorated may be renewed by replacing the wasted portion with a new section. The ligaments between the tube holes may be joined by means of welding and staytubes. Other acceptable means of lowering the stress on the repaired section may be used if in the judgment of the Officer in Charge, Marine Inspection, it is necessary.

§ 59.10-25 Stayed areas.

Welding repairs are permitted in staybolted areas or areas adequately stayed by other means so that should failure of the welds occur the stress will be carried by the stays. The welds shall be located entirely within staybolted areas and shall not pass through the outer row of stays.

§ 59.10-30 Seal welding.

Where leaks occur in riveted joints or connections, they shall be carefully investigated to determine the cause. Such leaks may be made tight by seal welding the edge, if, in the opinion of the Officer in Charge, Marine Inspection, this will make a satisfactory repair.

§ 59.10-35 Wrapper plates and back heads.

Wrapper plates and back heads may be renewed in whole or repaired as follows:

(a) Wrapper plates or back heads shall be cut between two rows of staybolts or on a line of staybolts where the thickness is approximately the same as the original construction. If welding is employed on a line of staybolts, the staybolts shall be fitted

with a welded collar as required by Figure 52.01-3 of this subchapter.

(b) The edges of wrapper plates riveted to tube sheets and back heads shall be removed by cutting out the rivets.

(c) The edges of existing plates and new plates shall be beveled by chipping, flame cutting or grinding so as to form a suitable groove whereby complete penetration of the weld metal will be obtained. The edge preparation and preheat shall comply with the requirements of § 59.10-5(h).

(d) The edges of the new plate shall be butt welded and the plate shall be riveted to the flanges of the tube sheet and back heads and the staybolts renewed.

(e) Sections of wrapper plates of combustion chambers outside of stayed areas may be repaired by welding provided the welded joints are stress-relieved by means of controlled heat and the joints are nondestructively tested.

Subpart 59.15—Miscellaneous Boiler Repairs

§ 59.15-1 Furnace repairs.

(a) Where corrugated or plain furnaces or flues are distorted by 1½ inches or more, they shall be repaired by either of the following methods:

(1) The furnace shall be forced back to a true circular shape, and the Officer in Charge, Marine Inspection, may require strongbacks or other acceptable means of support to hold the furnace from future collapse, if in his opinion such support is necessary; or,

(2) The furnace shall be adequately stayed as found necessary in the judgment of the Officer in Charge, Marine Inspection.

(b) Distortion means the difference between any single measured diameter of the furnace and the diameter of a true circle at the same location. The diameter of the true circle may be taken as the original furnace diameter or may be determined by a means acceptable to the Officer in Charge, Marine Inspection.

(c) Where the distortion does not exceed 1½ inches it will not be necessary to force the furnace back to a true circle if the allowable pressure is reduced in the ratio of 1½ percent for each one-tenth of an inch of distortion. However, if the maximum distortion does not exceed 1 inch and the length of the distorted area is not more than three corrugations, or, if the maximum distortion does not exceed three-fourths inch for a length greater than three corrugations of distorted area, the repairs or reduction in pressure will not be required unless considered necessary by the marine inspector.

(d) When it becomes necessary to rivet a patch to a furnace or other part of the heating surface, the riveted patch shall be placed on the waterside of the plate in order not to form a pocket in which sediment may collect.

(e) Furnace crowns which have become distorted, not in excess of the limitations provided in paragraph (c) of this section, may be repaired by pumping back the distorted section to as nearly a true circle as possible and reinforcing the same by means of a ring, arc- or gas-welded to the distorted corrugation as shown in Figure 59.15-1, the welding to be done by welders and welding processors qualified in accordance with part 57 of this subchapter using acceptable welding electrodes in accordance with § 57.02-4 of this subchapter.